

nearly as calyx oblong, included, seeds rounded to oval-angular.

Distribution: Nepal, Sikkim, Bhutan, Tibet.

Materials examined: SIKKIM. Reg. Alp. alt. 13-1400 ft *Hooker* 10 (ISOTYPE-CAL); Kapoor, alt. 13,000 ft. Dt. 12-7-1910. *W. W. Sm* 3405; Pey keiong La, June 1887. Dr. King's Col-

lector. s.n. Acc. No. 272329 (CAL); Jongri, alt. 12-14,000 ft. dt. 1881. *G. Watt* 5414; NEFA. Kameng Dist. alt. 10,000. dt. 28-5-57. *R. S. Rao* 7894 (B.S.I. Shillong); Se La alt. 4300 dt. 1st. September, 1964, *J. Joseph* 40201 (B.S.I. Shillong).

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36. FURTHER NOTES ON THE IDENTIFICATION OF THE GENUS *TEPHROSIA* PERS.

(With seven text-figures)

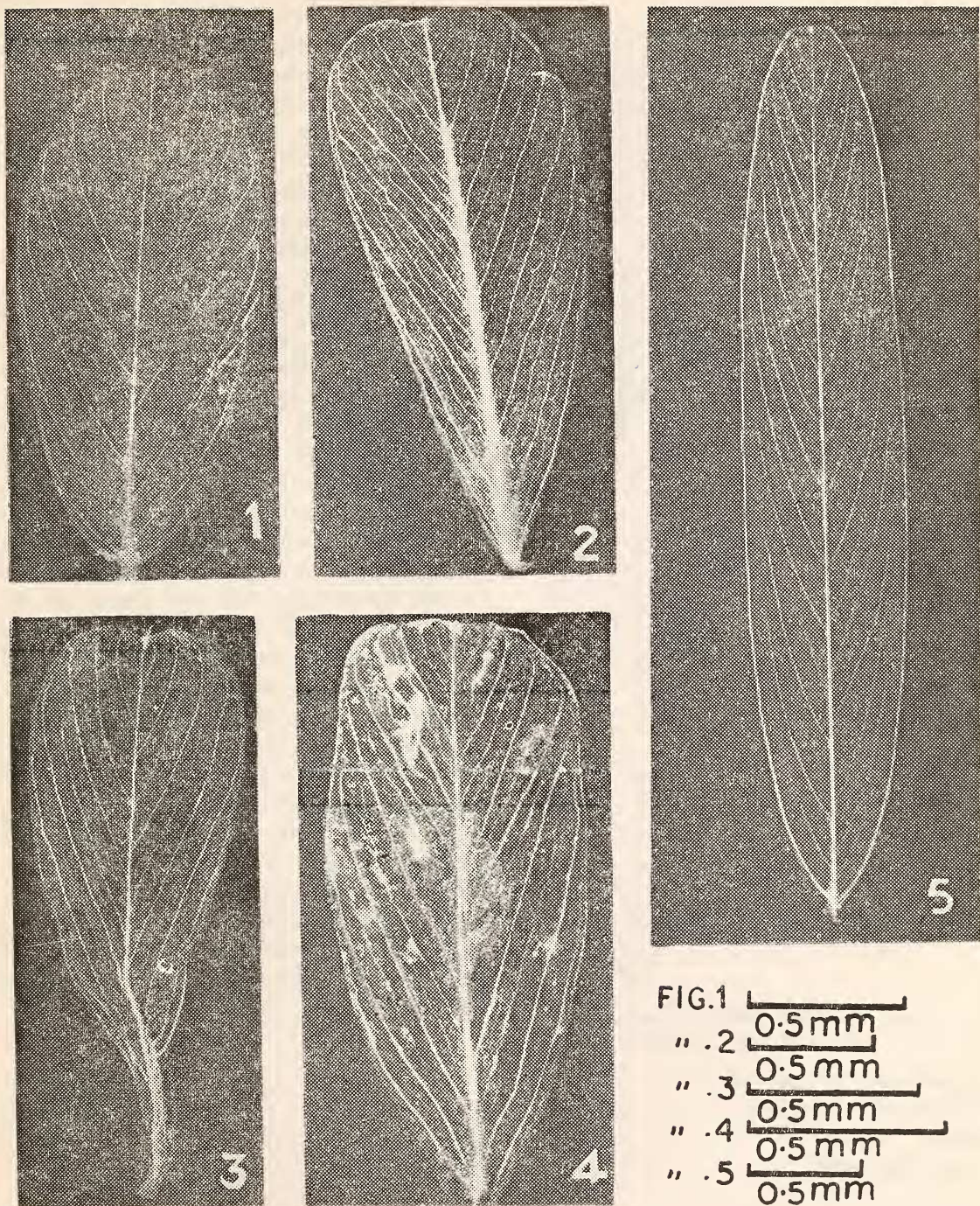
In an earlier volume of the *journal*, Mukherjee and Gupta (1970) have described an easy way of distinguishing species of *Tephrosia* from those of other genera, like *Indigofera* in the field, when not in flowering stage. By pulling apart the leaflets, after holding them at their bases and tips, the leaflets of *Tephrosia* species always show a V-shaped cut (Fig. 6A), while *Indigofera* leaflets when similarly pulled show a more or less straight cut (Fig. 7A). With a view to find the reasons for such a differentiating feature, we studied the leaves of several species of *Tephrosia* and *Indigofera*.

The leaflets of both species were decolourized by keeping in a weak solution of KOH for some days and later stained with alcoholic saffranin, dehydrated and mounted in D.P.X. All the slides thus prepared, showed the type of venation characteristic of leaflets of both the genera.

Tephrosia leaflets have a strong mid-rib and from it secondary branches, almost in pairs,

are given out to the wings of the lamina at an acute angle (Figs. 1 to 5). In some cases, when they near the margin they show a fork. One of the arms of the fork when it reaches near the margin curves towards the apex, is thicker than the other which becomes slender and later disappears in the thin mesophyll parenchyma (Figs. 2, 3 & 4). The successive pairs of these secondary veins enclose very little strips of thin walled tissue. When these leaflets were pulled apart as said in the beginning, the thin walled tissues in between the lateral veins give way, leaving these veins as they are. This results in the formation of a V-shaped cut (Fig. 6A). On the other hand, the leaflets of *Indigofera* have a uniform pattern of secondary veins, in that the secondary veins depart from the mid-rib more or less at right angles while entering the wings of the lamina. Moreover, these are comparatively thinner. This thinner pattern of venation might be the cause of the straight cut seen when the

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Figs. 1—5. Show cleared leaflets of *Tephrosia*. 1. *Tephrosia pauciflora* Wall.; 2. *T. purpurea* Pers.; 3. *T. apollina* Link.; 4. *T. coccinea* Wall.; 5. *T. tenuis* Wall.

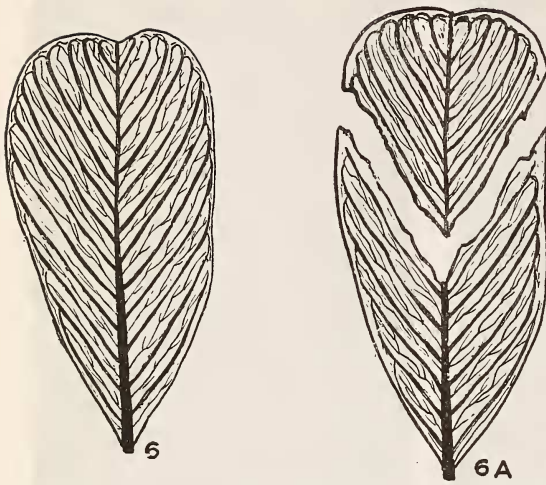


Fig. 6 and 6A. Show leaflet of *Tephrosia* Pers. entire and torn respectively.

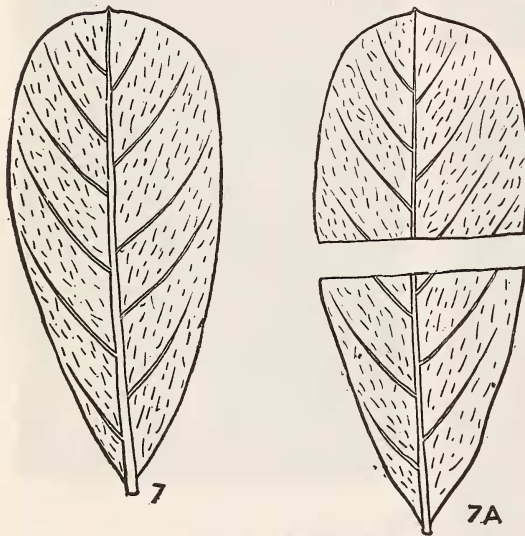


Fig. 7 and 7A. Show leaflet of *Indigofera* Linn. entire and torn respectively.

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leaflets were pulled apart (Fig. 7A).

In this connection, it is interesting to mention what has been written in ancient Sanskrit Scriptures on Indian System of Medicine. (*Ayurveda*). Since *Tephrosia* has a great medicinal value in the Indian System of Medicine (Acharya & Kudatarkar Shastri) they describe a simple clue to separate *Tephrosia* leaves from other similar leaves in the fields. It states "When the leaves of *Tephrosia* are pulled apart, the torn region gives an appearance of a tail of an arrow" (*Sharapunkhi*). After carrying out this simple test on leaves to confirm *Tephrosia*, it should be collected and then processed and used against worms etc. (Antihelmin). A similar reference is also given by Acharya in his works. Both these mention the plants' use against liver troubles and Kirtikar & Basu (1935) emphasise its cathartic properties. It is well known that both the plants can be used as cover crops and also as green manure.

In conclusion, it may be stated, that the old Ayurvedic System knew the field identification of *Tephrosia*. The anatomical observations stated above, clearly show that the venation pattern itself is the cause for the peculiar tearing of the leaflets of the genus *Tephrosia*.

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